(No Model.)

W. M. TILLMAN.

BLOWPIPE.

No. 605,935. Patented June 21, 1898.

Fig. 1.

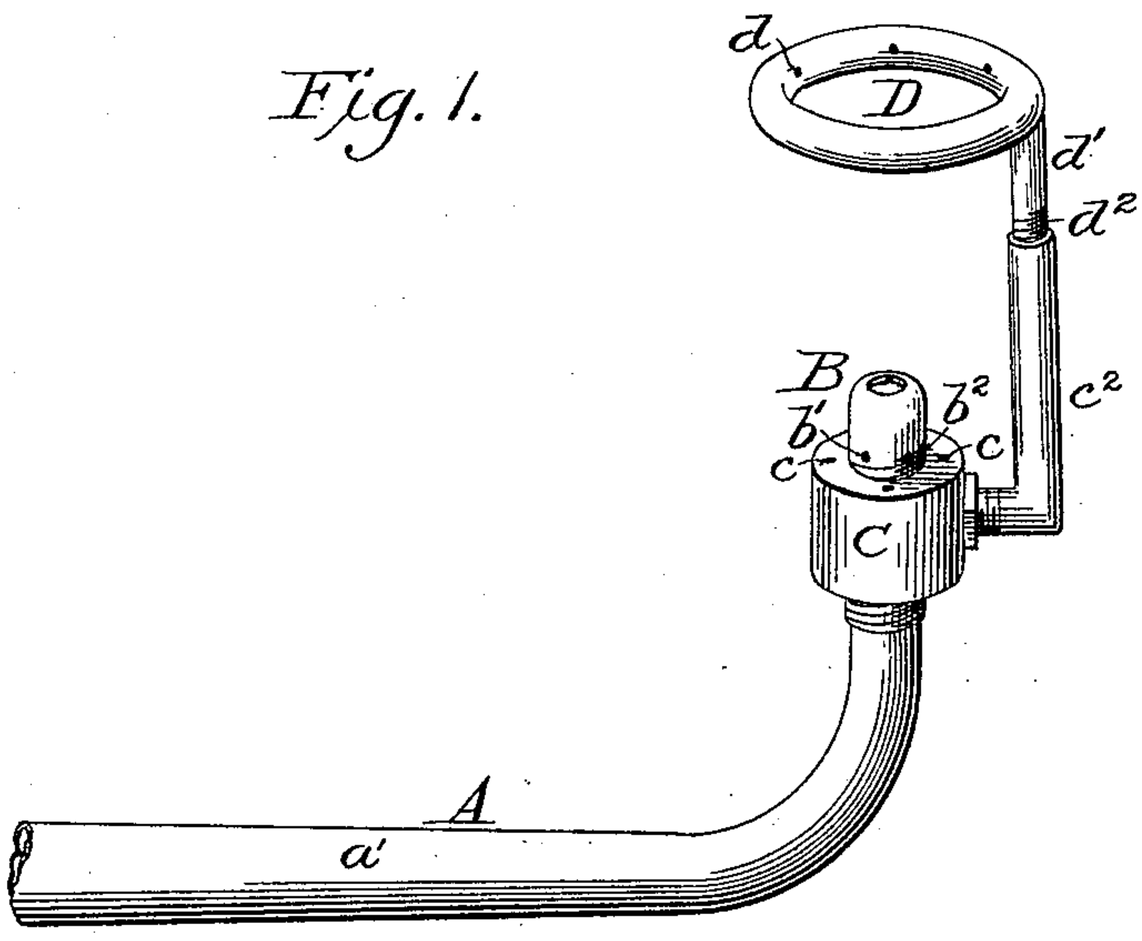
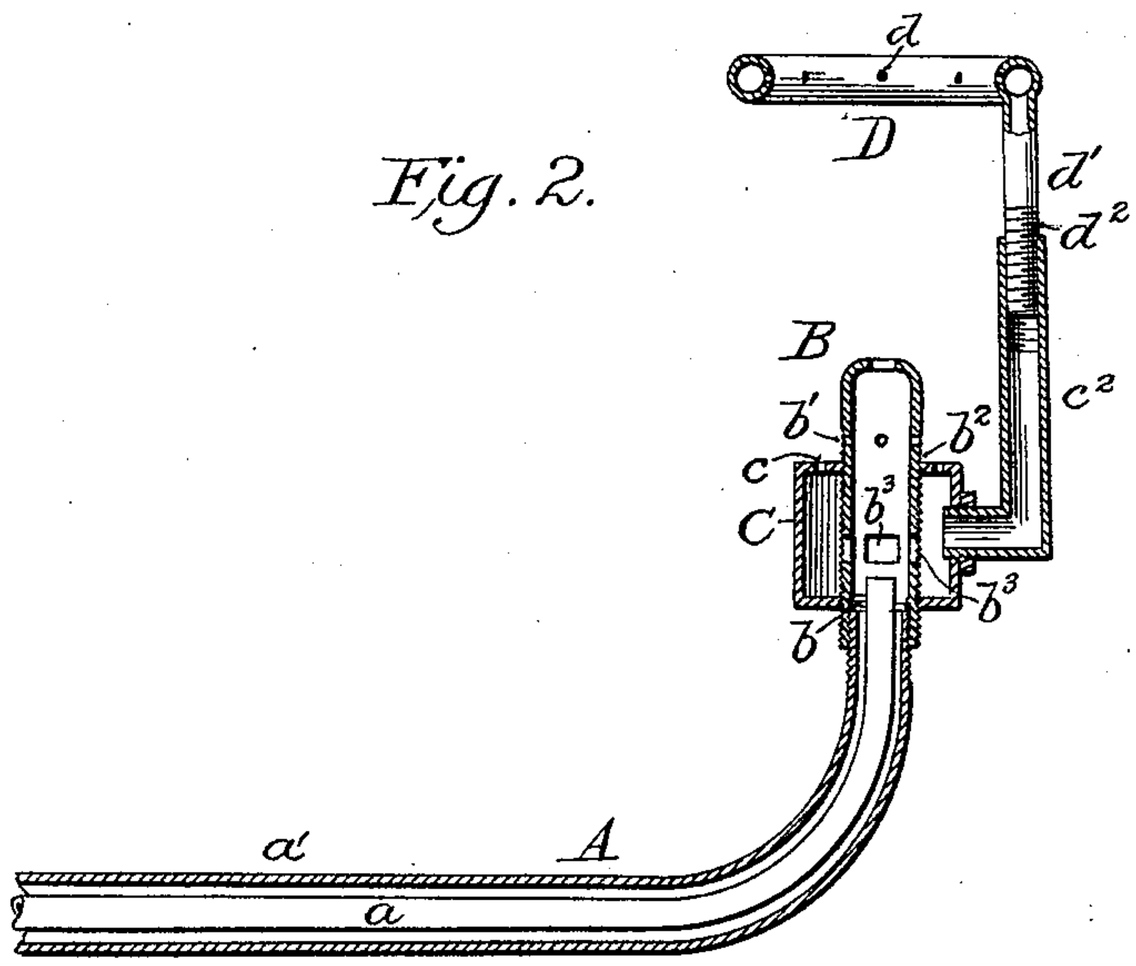


Fig. 2.



Witnesses
Gales P. Moore.
W. B. Corwin

Inventor
William M. Tillman,
by C. A. Sturtevant
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM M. TILLMAN, OF SALT LAKE CITY, UTAH.

BLOWPIPE.

SPECIFICATION forming part of Letters Patent No. 605,935, dated June 21, 1898.

Application filed March 13, 1896. Serial No. 583,121. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. TILLMAN, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake, State of Utah, have invented certain new and useful Improvements in Blowpipes, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to blowpipes, and more particularly to a cap or tip to be attached to said pipes, my object being to provide a structure particularly adapted for use in burning natural gas, although the device is in no wise limited to such use. It has been ascertained that it is difficult to use natural gas in blowpipes as heretofore constructed, for the reason that such gas found in many localities contains a large proportion of nitrogen, which interferes with combustion, and thus the flame is easily blown out.

To generally improve upon structures of the character indicated, the invention consists in the various matters hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a blowpipe provided with my invention; and Fig. 2 is a sectional elevation of the improved tip or cap, to which the present invention more particularly relates.

Referring more particularly to the drawings, A represents the usual construction of blowpipe, comprising an inner air-tube *a* and an outer gas-tube *a'*, to which my improved cap is to be attached. This cap comprises a tip B, having suitable provision, as the interior threads *b*, for attachment to the outer tube *a'* of the main portion of the blowpipe, and through this tip a suitable distance below the top extend a series of small openings *b'*. A drum or collar C is suitably secured upon the tip B, as by the threads b^2, and communicates through openings b^3 in the tip with the gas-passage through the blowpipe. Thus the drum and tip form a chamber into which the gas is received. A series of suitable openings *c* in the top of the drum lie near the openings *b'* in the tip. The drum may be made to snugly fit the tip in any suitable manner, in the present instance the openings in the top and bottom for the reception of the tip being threaded and engaging corresponding threads on the exterior of the tip.

From the drum the gas is conducted to the primary burner D, which is here shown as a hollow ring with openings *d* on the inner circumference. A tube *d'* is connected with this ring or burner, which tube has adjustable connection by means of threads d^2 with a tube c^2, leading from the drum. In this way the distance between the primary burner and the tip B can be regulated to accommodate various pressures of gas.

Referring now to the operation of the present device, it will be seen that a constant flame is maintained between the openings *b'* and *c*, while flames are also constantly maintained from the openings *d*, said latter flames being directed toward the center of the ring D. This ring, the drum C, and the tip B are therefore kept heated, the said drum and tip thus acting as a preliminary heater for the mingled gas and air received from the blowpipe. In fact, it has been found that the gas in the drum and tip is heated to or about the temperature of combustion. Thus the gas and air enter the tip and drum, where they commingle and are heated, while the blast through the air-tube *a* forces the gas and air through the tip toward the primary burner D. During its passage between the tip and said primary burner the gas is further enriched with oxygen and at the primary burner combustion takes place. Actual use has shown this construction to be a most efficient one, for the preliminary heating causes more intimate mingling of the gas and air, thus producing better combustion and consequent freeing of the nitrogen, and the gas being enriched with oxygen of the air both in the receiving chamber and during its passage from the tip to the burner D the flame is intense and not easily blown out.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a blowpipe or the like, a tip, a primary burner located a considerable distance from said tip, and in the direction toward which the gas flows after passing through the tip, means for supplying gas to the primary burner and means for varying

the distance between the tip and the primary burner, whereby a flame is maintained at the primary burner, and the gas which passes through the tip, after leaving said tip, passes through the air to the primary burner and combustion there takes place; substantially as described.

2. A burner comprising in combination, a gas-receiving chamber having means for attachment to the pipe, a tip upon said chamber, a pipe leading from said chamber, and a primary burner supported by said pipe a considerable distance from the tip but in the direction toward which the gas passes after leaving the tip, whereby a flame is maintained at the primary burner, and the gas which passes through the tip, after leaving said tip, passes through the air to the primary burner and combustion there takes place; substantially as described.

3. A cap for burners comprising a tip having a flame-opening, a drum surrounding said tip and communicating therewith and provided with openings *c* and a primary burner situated above the drum, the said drum and burner producing concentric flames, substantially as described.

4. A cap for burners comprising a tip having a flame-opening, a drum surrounding said tip and communicating therewith and provided with openings *c* and a primary burner situated above the drum, the said drum and burner producing concentric flames, said tip having also auxiliary openings *b'*, substantially as described.

5. A burner comprising in combination, a receiving-chamber having means for attachment to the pipe, a tip upon said chamber, a pipe leading from said chamber, a second pipe adjustably telescoping with the first-mentioned pipe, and a primary burner supported by said second pipe a considerable distance from the tip but in the direction toward which the gas passes after leaving the tip, whereby a flame is maintained at the primary burner, and the gas which passes through the tip, after leaving said tip, passes through the air to the primary burner and combustion there takes place; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM M. TILLMAN.

Witnesses:

GERTRUDE E. CORKER,

BENJAMIN W. JERMENS.